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## Notes on some western Lichens

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Having occasion recently to write up the labels for a collection of lichens made in the Yukon region, in the years 1898 and 1899, and also for a small collection I made chiefly in the Blackfeet Indian Reservation of northern Montana, in the summer of 1897, I found a number of unnamed species and also various corrections which it seemed to me might be made.

### SPECIMENS FROM YUKON

The Yukon specimens were often in none too great quantity as they were picked up as occasion permitted without any previous preparation for that line of work. Duplicates of most of the Yukon collection I sent to the late T. A. Williams, of Washington, and to Miss Cummings, of Wellesley, and perhaps two thirds of these were determined by Mr. Williams, but no list published. Some years later another not very complete set was sent to Dr. R. Heber Howe and of these, determinations, partly made by Dr. Hasse, were published in the Bulletin of the Torrey Botanical Club (38: 287-293. 1911).

I now find in going over the original collection a number of species not seen by Dr. Howe and also some discrepancies owing, doubtless, partly to mixtures, lack of material or poor specimens. I shall first mention the Yukon plants not sent to Dr. Howe. They are the following well-known and widely distributed species:

*LECIDEA DECIPIENS* (Ehrh.) Ach.

Dawson, on rock, April, 1899 (49).

*LECIDEA GRANULOSA* (Ehrh.) Poetsch.

Hills above Lake Lindeman, May, 1898 (50).

*CLADONIA PYXIDATA* (L.) Hoffm.

Lake Lindeman, May, 1898 (4a).

*RHIZOCARPON GEOGRAPHICUM* (L.) Lam. & DC.

Dawson, April, 1899 (81).

RHIZOCARPON PETRAEUM (Wulf.) Massal.

Dawson, very common (101).

PELTIGERA APHTHOSA (L.) Hoffm.

Lake Lindeman, May, 1898 (34).

NEPHROMOPSIS CILIARIS (Ach.) Hue.

Lake Lindeman, April, 1898 (16).

CETRARIA ISLANDICA CRISPA Ach.

Lake Lindeman, April, 1898 (15a).

PARMELIA PHYSODES (L.) Ach.

Dawson, common, October, 1898.

One species referred to in Howe's list, however, I do not find in my collection, namely, that under No. 11 in his enumeration, which is called *Biatora franciscana* Tuck. This was part of my collection number 56; in what is left everything is evidently *Lecanora calcarea* (L.) Nyl., as determined by Dr. Hasse.

The remaining notes on Yukon specimens are taken up in order, according to Dr. Howe's numbers, and relate to changes, the numbers in parentheses being my collection numbers.

8. LECIDEA TESSELLATA Floerke. The specimen (52) was sent to Dr. Hasse, and referred to *Lecidea*, but was "too fragmentary for a satisfactory examination," in his opinion.

33. LECANORA LENTIGERA (Web.) Ach. On earth of river bluff just below Dawson, April, 1899 (64); evidently this, a fine and apparently rare species. Another specimen, however (87), questionably referred to *L. crassa*, under the impression that it was not distinct from *L. lentigera*, is certainly quite different from either. It is evidently *L. thamnoplaca* Tuck., not previously known north of Montana and but rarely collected. It was first obtained by Bolar in Nevada and next by Dr. Coulter in Yellowstone Park.

34. The specimens under this number, called *Lecanora thamnoplaca* Tuck., Dawson, April, 1898 (51), are all in my packet *Lecanora fruticulosa* (Dicks.) Ach.

35. The two collections here referred to *Lecanora pallida* have rather too large spores for that species. One (63a) has ellipsoid spores  $\frac{40}{25} \mu$ , which I should refer to *L. tartarea* (L.) Ach.; the other

(99), with spores  $\frac{70}{35} \mu$ , I should think *Ochrolechia pallescens* (L.) Massal. The spores of *L. pallida* (Schreb.) Schaer. are given as  $\frac{9-20}{7-11} \mu$ ; otherwise *O. pallescens* is very similar to *L. pallida*.

36. Called *Lecanora subfusca* var. *argentea* Ach. This is certainly the same as No. 34, or *L. fruticulosa*, previously credited in North America only to California, I believe.

39. Called *Lecanora epibrya* Nyl. Dawson, July, 1898 (30). My specimens apparently not distinct in any way from the preceding.

40. In my set none of the specimens under this number (88) are distinct from No. 34. *Lecanora castanea* (Hepp) Th. Fr., as given in Howe's list, does not seem to be represented.

53. All poor specimens under this number (91), apparently charred by fire. They were doubtfully referred to *Ephebe pubescens* (L.) Fr. Collected at Dawson, July, 1898 (91). I think the species is rather *Lecidea globifera* Ach., from which I believe *Biatora Russellii* Tuck. is not distinct.

56. This is typical *Solorina saccata* (L.) Ach., rather than the var. *spongiosa*, which it is called. Collected at Dawson, August, 1898 (35). The other specimen under the name *S. saccata*, from Lake Lindeman, May, 1898 (22), seems to be rather *Pannaria hypnorum* (Wahl.) Koerb. The spores are not more than  $\frac{12}{8} \mu$  and eight in the ascus. *Solorina saccata* has spores mostly four in the ascus and  $\frac{36-55}{18-28} \mu$ .

Three other species referred to in the list proved to be indeterminable in the duplicates sent out. I believe them to be as follows:

CLADONIA GRACILIS CHORDALIS Floerke.

Lake Lindeman, May, 1898 (6).

BUELLIA COLLUDENS (Nyl.) Tuck.

Dawson, December, 1898 (82), with no spores; Dawson June, 1899 (82a), with spores two-celled, about  $\frac{16}{7} \mu$ , pale and eight in the ascus.

LECIDEA DECIPIENS (Ehrh.) Ach.

Dawson, on rock, April, 1899 (49). A widely distributed species.

SPECIMENS FROM MONTANA

ENDOCARPON TORTUOSUM Herre.

Near Big Badger Creek, Blackfeet Indian Reservation, September, 1897 (92). This species was described by Herre in 1911 from specimens collected near Reno, Nevada. I find no other record except these Montana specimens. The genus is peculiar in having oblong, muriform, brown spores, mostly two in the ascus; in this species measuring about  $\frac{50}{18}\mu$ .

ENDOCARPON PUSILLUM Hedw.

Heart Butte, September, 1897 (100). A much smaller species than the preceding, closely adnate to rocks and forming blackish discolorations. Spores similar to, and nearly as large as, the preceding, measuring about  $\frac{45}{18}\mu$ .

LECIDEA AMYLACEA Ach.

Henry Mountain, Blackfeet Indian Reservation, August, 1897 (95). We seem to have in the museum no specimen of this from North America. It is credited to Greenland and to Utah by Tuckerman.

LECIDEA ARMENIACA (DC.) Fr.

Blackfeet Indian Reservation, August, 1897 (87); fruiting. This species has been rarely collected in North America, and not before in fruit, I believe. In many respects, the plant is not so very unlike *Lecanora esculenta* of Arabia, which is supposed to be the manna of the ancient Jews. The taste is evidently quite similar.

ACAROSPORA RHAGADIOSA (Ach.) Fr.

On perpendicular walls of sandstone just below the Great Falls of the Missouri, February, 1889 (90); in fruit. This appears to be the only collection made of this species in North America. It seems a well-defined species, known previously only from Europe. The determination was by Nylander.

ACAROSPORA CERVINA (Wahl.) Koerb.

Two-medicine Lake, Blackfeet Indian Reservation, August, 1897 (97). This is a small western species, on rock, with apothecia more or less immersed and the ascus crowded with minute spores about  $\frac{4}{2} \mu$ . It has been mostly collected in California, under the name *Lecanora fuscata* (Schrad.) Th. Fr. This seems to be its most northern record.

ACAROSPORA CHLOROPHANA (Wahl.) Massal.

Henry Mountain, Blackfeet Indian Reservation, at 7000 ft., August, 1897. One of the most conspicuous of yellow, rock-loving species. The Golden Gate (or Gardiner) entrance to Yellowstone Park takes its name, I believe, from the quantity of this lichen covering the rock-walls near.

LECANORA ATRYNEA (Ach.) Nyl.

Near Two-medicine Lake, August, 1897 (90). The specimens more closely resemble some from the Pyrenees, determined by Nylander, than those from California collected by Herre. The California specimens are the only ones of North America in the museum, but it is mentioned in Miss Cummings's list of Alaska species as credited to that region by Dr. Almquist.

LECANORA THAMNOPLACA Tuck.

Columbia Falls, November, 1893, in fine fruit (91); also collected east of the Rocky Mountain Divide in Montana.

BLASTENIA FESTIVA (Fr.) Hasse.

Near Forty-mile Creek, Blackfeet Indian Reservation, August, 1897 (106). A small and inconspicuous rock-loving species. These Montana specimens appear to be the only ones collected outside of California in this country, but I believe are correctly referred here although the spores are not polar-bilocular as ordinarily occurs in this genus. Hasse states that the spores may be simply bilocular.

RINODINA CHRYSOMELAENA (Ach.) Tuck.

Forty-mile Creek, Blackfeet Indian Reservation, August, 1897 (116). This species has been but rarely collected and not before to the westward of the Mississippi, I believe.